COMPUTER HARDWARE
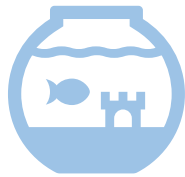
INFORMATION SHEET 1.1-1

LEARNING OBJECTIVES

Identify different type and parts of computer

Explain hardware component of a computer.

INTRODUCTION

COMPUTER

A computer is an electronic device that manipulates information, or **"data."** It can **store**, **retrieve**, and **process data**.

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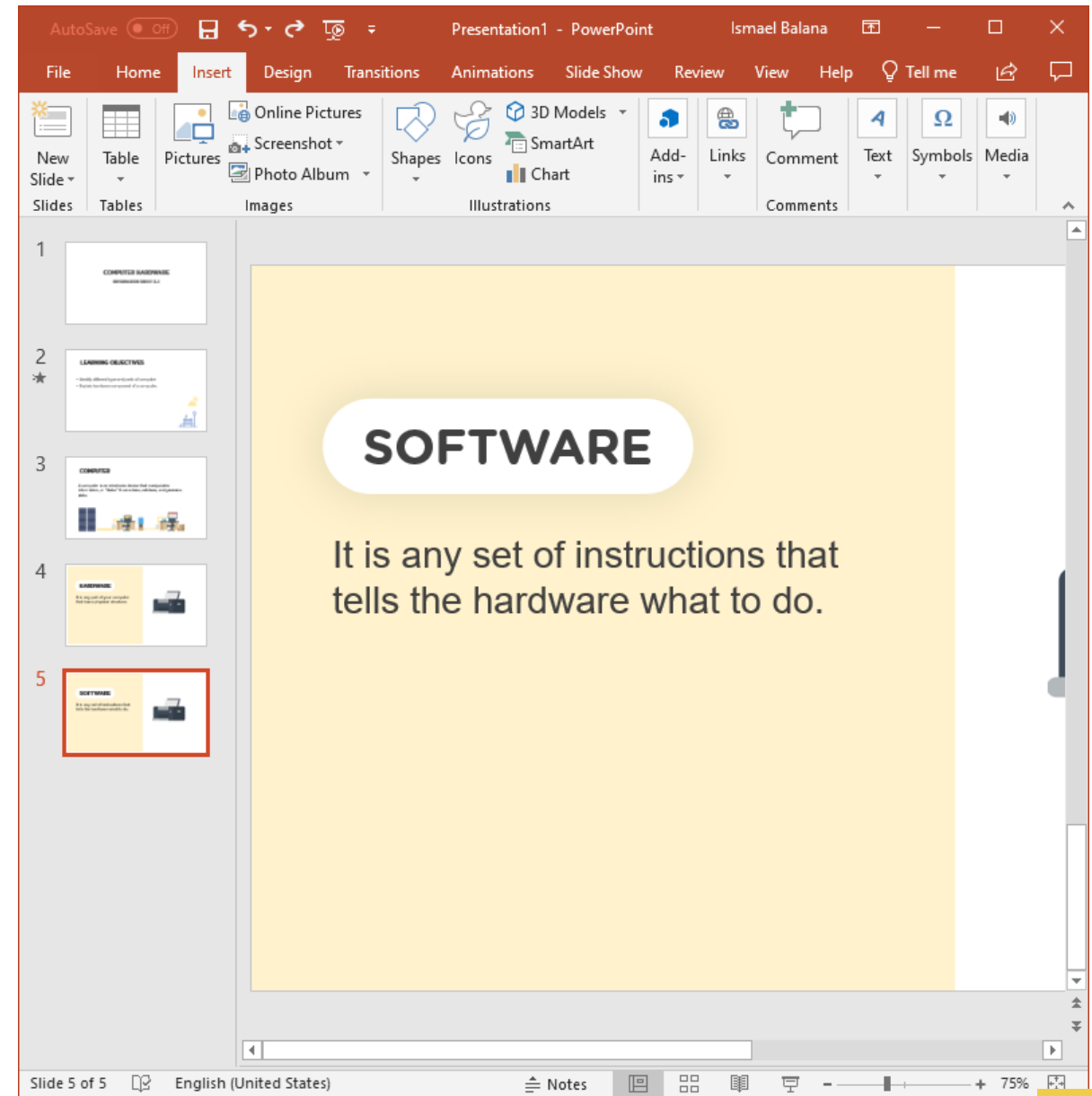# HARDWARE

It is any part of your computer that has a physical structure.

SOFTWARE

It is any set of instructions that tells the hardware what to do.

DESKTOP COMPUTER

Desktop computers are designed for use at a desk or table. They are typically larger and more powerful than other types of personal computers. Desktop computers are made up of separate components.

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LAPTOP

Is battery or AC-powered personal computer that are more portable than desktop computers, allowing you to use them almost anywhere.

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SERVER

It a computer that "serves up" information to other computers on a network.

a server is an example of a computer program or device that accepts and responds to requests made by another program, known as a client.

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TABLET

A tablet, tablet computer, or tablet PC is a mobile computing device designed to be held in one or two hands.

It is approximately the size of a hardcover book (seven inches or bigger), and resembles a large smartphone.

SMARTPHONE

is a cell phone that allows you to do more than make phone calls and send text messages.

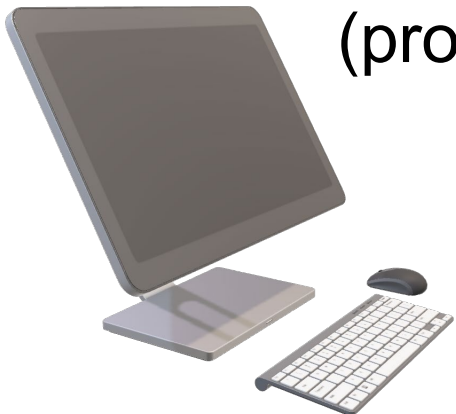can browse the Internet and run software programs like a computer.

use a touch screen to allow users to interact with them

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Two Main Style of Personal Computer

MAC

The Macintosh computer was introduced in 1984, and it was the first widely sold personal computer with a Graphical User Interface, or GUI (pronounced gooey).

PC

This type of computer began with the original IBM PC that was introduced in 1981.

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BASIC PARTS OF COMPUTER

SYSTEM UNIT

The system unit is the core of a computer system. Usually it's a rectangular box placed on or underneath your desk.

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MOUSE

Mouse is used to interact with items on your computer screen.

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MONITOR

referred to as a VDT (video display terminal) and VDU (video display unit), a monitor is an output device that displays video images and text.

Like most early TVs, the first computer monitors were comprised of a CRT (cathode ray tube) and a fluorescent screen. Today, all monitors are created using flat panel display technology, usually backlit with LEDs. The image to the right shows an ASUS LCD monitor.

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KEYBOARD

It is an input device the main way to enter information into your computer.

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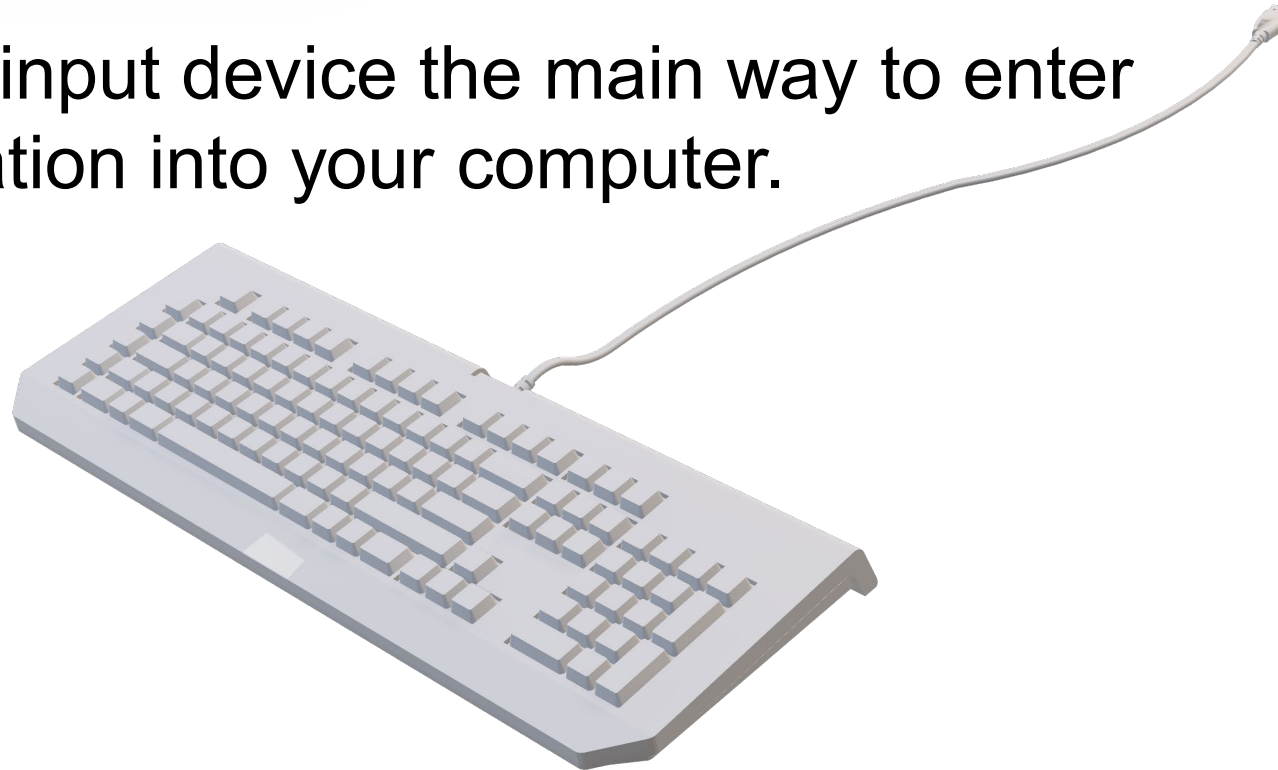
SPEAKER

Speakers are used to play sound. They can be built into the system unit or connected with cables. Speakers allow you to listen to music and hear sound effects from your computer.

CSS

PRINTER

A printer is an external hardware output device that takes the electronic data stored on a computer or other device and generates a hard copy of it.

For example, if you created a report on your computer, you could print several copies to hand out at a staff meeting. Printers are one of the most popular computer peripherals and are commonly used to print text and photos.
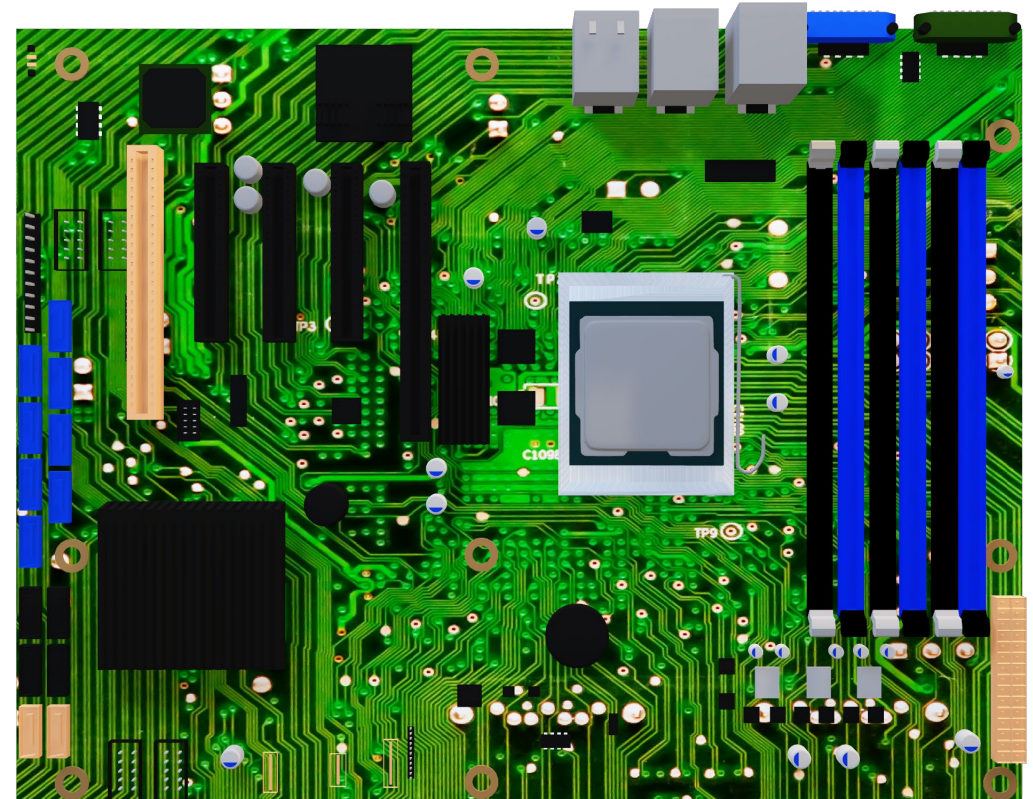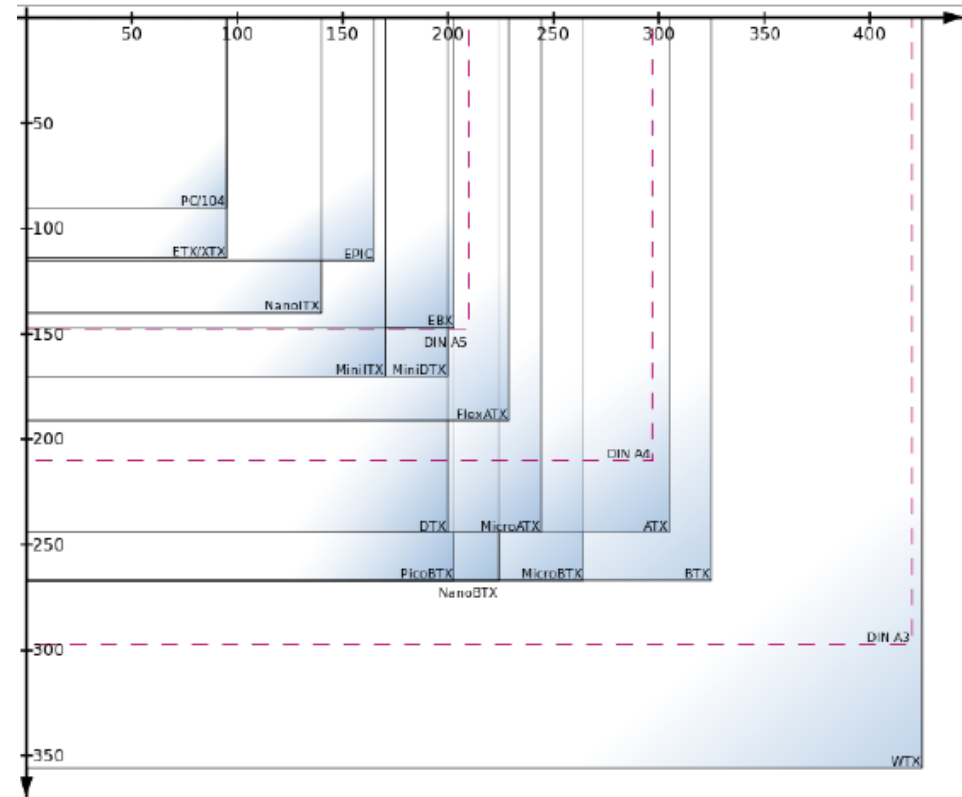
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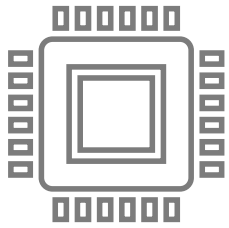
THE INTERNAL HARDWARE

CSS

MOTHERBOARD

It is the main circuit board within a typical desktop computer, laptop or server.

MOTHERBOARDFORM FACTORS

is the specification of a motherboard – the dimensions, power supply type, location of mounting holes, number of ports on the back panel, etc.

CENTRAL PROCESSING UNIT

The PC processor also called the central processing unit. It is the hardware within a computer that carries out the instructions of a computer program by performing the basic arithmetical, logical, and input/output operations of the system.

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Clock Speed

is a processor's rating that measure a certain number of information processed per second.

FSB Front Side Bus

serves as the processors connection to the system memory. FSB transfer speed allows better processor performance.

Cache

enables the processor to speedily access recently used information.

FSB Front Side Bus

serves as the processors connection to the system memory. FSB transfer speed allows better processor performance.

32-bit (x86)   vs.   64-bit (x64)

There are two different types of CPUs. There is a 32-bit CPU and there is a 64-bit CPU. The main difference between these two processors is the structure. The older processor which is the 32-bit processor has a structure that can process instructions less efficiently than a 64-bit processor.
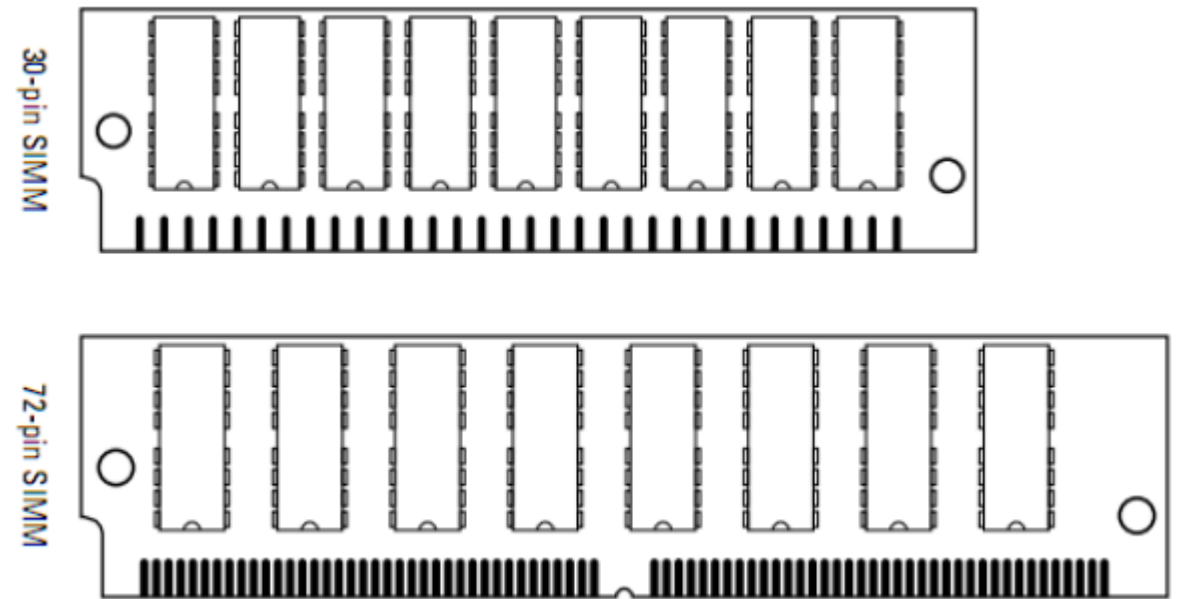
RANDOM ACCESS MEMORY

is a hardware device that allows information to be stored and retrieved on a computer. RAM is usually associated with DRAM, which is a type of memory module.

RAM is a volatile memory and requires power to keep the data accessible. If the computer is turned off, all data contained in RAM is lost.

SINGLE INLINE MEMORY MODULE

SIMMs come in two main sizes, as shown in figure below, so both sizes require a different-size socket. Ancient, pre-Pentium computers use the smaller size (3½ inches long), which has 30 pins and usually holds less than 20MB of memory.

NOTES: SIMMs are yesterday's technology from early '90s computers. Don't buy SIMMs for modern PCs

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SDRAM DIMM (Synchronous Dynamic Random Access Memory Dual In-line Memory Modules)

To meet the increased memory demands of newer and more powerful Pentium and AMD CPUs, designers created the speedier SDRAM DIMMs. With 168 pins, the 5 ¼-inch DIMMs (as shown below) look much like longer SIMMs.
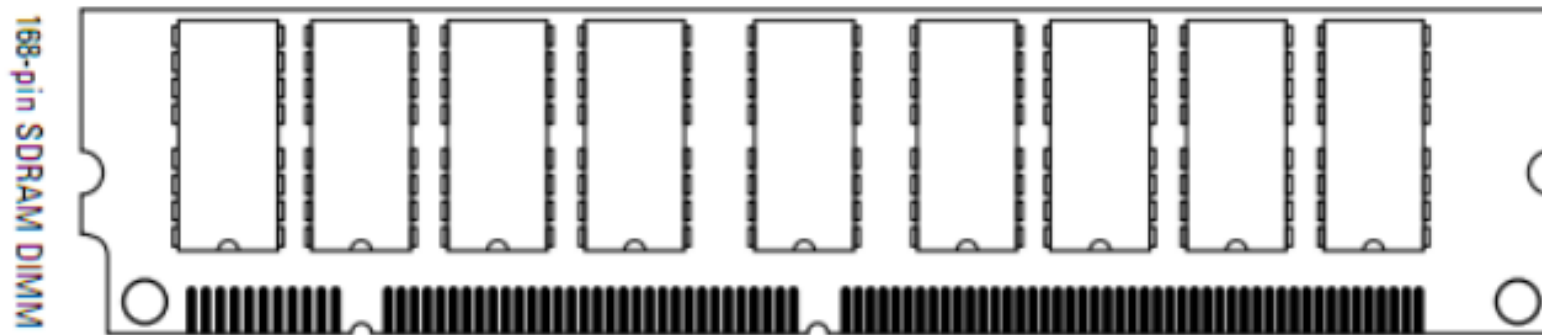
NOTES: Usually called simply SDRAM, DIMMs ruled the computer world through most of the '90s.

# RDRAM (Rambus Dynamic Random Access Memory) or RIMM

Rambus, Inc., created a super-fast, super-expensive memory in the late 1990s and covered the chips with a cool-looking heat shield.
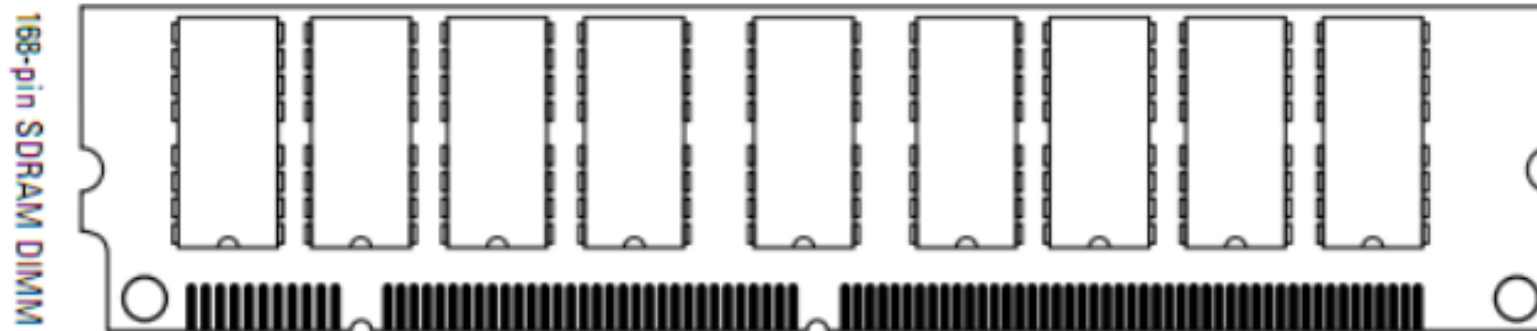
NOTES: Usually called simply SDRAM, DIMMs ruled the computer world through most of the '90s.

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DDR SDRAM (DOUBLE DATA RATE SYNCHRONOUS RANDOM ACCESS MEMORY)

biggest competitor to RDRAM, this stuff does some tricky piggybacking on the memory bus to speed things up dramatically
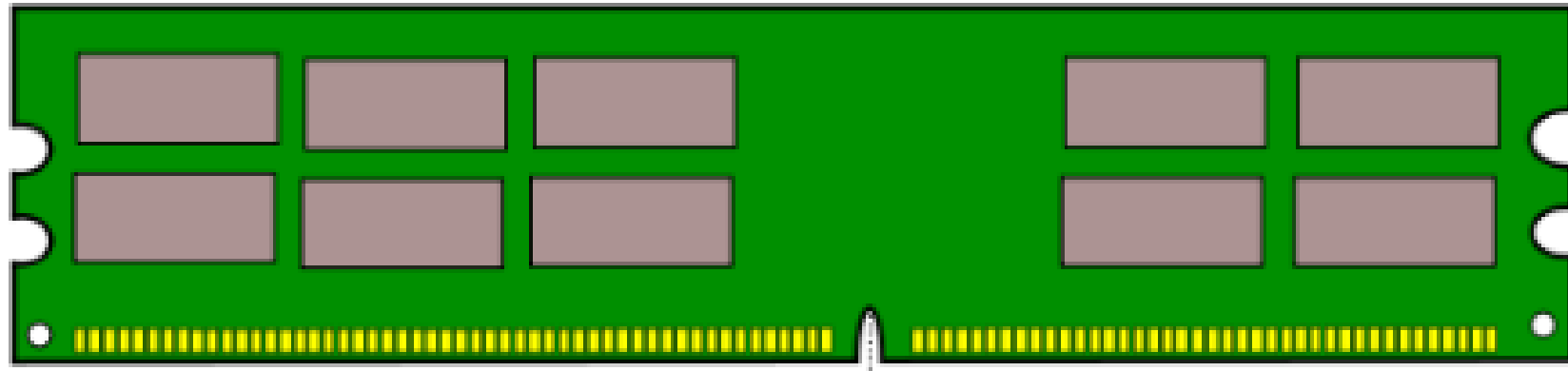
NOTE: *Pentium 4 computers that don't use RDRAM often use DDR SDRAM memory. However, make sure your motherboard specifically supports DDR SDRAM before buying it. (DDR is also known as Dual Channel.)*

DDR2 SDRAM (DOUBLE DATA RATE SYNCHRONOUS RANDOM ACCESS MEMORY)

Short for double data rate two, DDR2 is the second generation of DDR memory that was released in **September 2003**. DDR2 is capable of operating at greater speeds than DDR, offers a greater bandwidth potential, operates on less power, and generates less heat. Due to architectural differences, DDR2 memory modules are incompatible with DDR slots.

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is a type of SDRAM (synchronous dynamic random-access memory) released in June 2007 as the successor to DDR2.

DDR3 chips have bus clock speed of 400 MHz up to 1066 MHz, range in size from 1 to 24 GB, and consume nearly 30% less power than their predecessors.

Notes: DDR3 RAM sticks for a desktop computer have 240 pins. For a laptop computer, DDR3 RAM sticks have 204 pins.

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DDR4 SDRAM (DOUBLE DATA RATE SYNCHRONOUS RANDOM ACCESS MEMORY)

DDR4 is a type of system memory known as SDRAM and was released in **September 2014** as the successor to DDR3. DDR4 has bus clock speeds that range from 800 to 1600 MHz and range in storage capacity from 4 to 128 GB per DIMM. DDR4 is also more efficient at 1.2 V when compared to DDR3's 1.5 to 1.65 V range.

These memory chips can only be installed on a motherboard that supports DDR4 memory and are not backward compatible with DDR3 memory slots.

DDR4 Random Access Memory

FURY HyperX DDR4

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HARD DISK

(sometimes abbreviated as hard drive, HD, or HDD) is a non-volatile memory hardware device that permanently stores and retrieves data on a computer.

secondary storage device that consists of one or more platters to which data is written using a magnetic head

All computers have a hard drive installed in them, which is used to store files for the operating system, software programs, and a user's personal files. A computer cannot function without a hard drive installed, as it requires one to function properly.

CSS

HARD DISK

New users often confuse RAM (memory) with disk drive space. See our memory definition for a comparison between memory and storage. Unlike RAM a hard drive keeps all stored information even with the power is turned off.

All computers have a hard drive installed in them, which is used to store files for the operating system, software programs, and a user's personal files. A computer cannot function without a hard drive installed, as it requires one to function properly.

POWER SUPPLY UNIT

Convert direct current (DC) power that your motherboard, drives and other peripherals need.

Cooling System

Power Switch

Port for power cord

Cable to deliver power to the system

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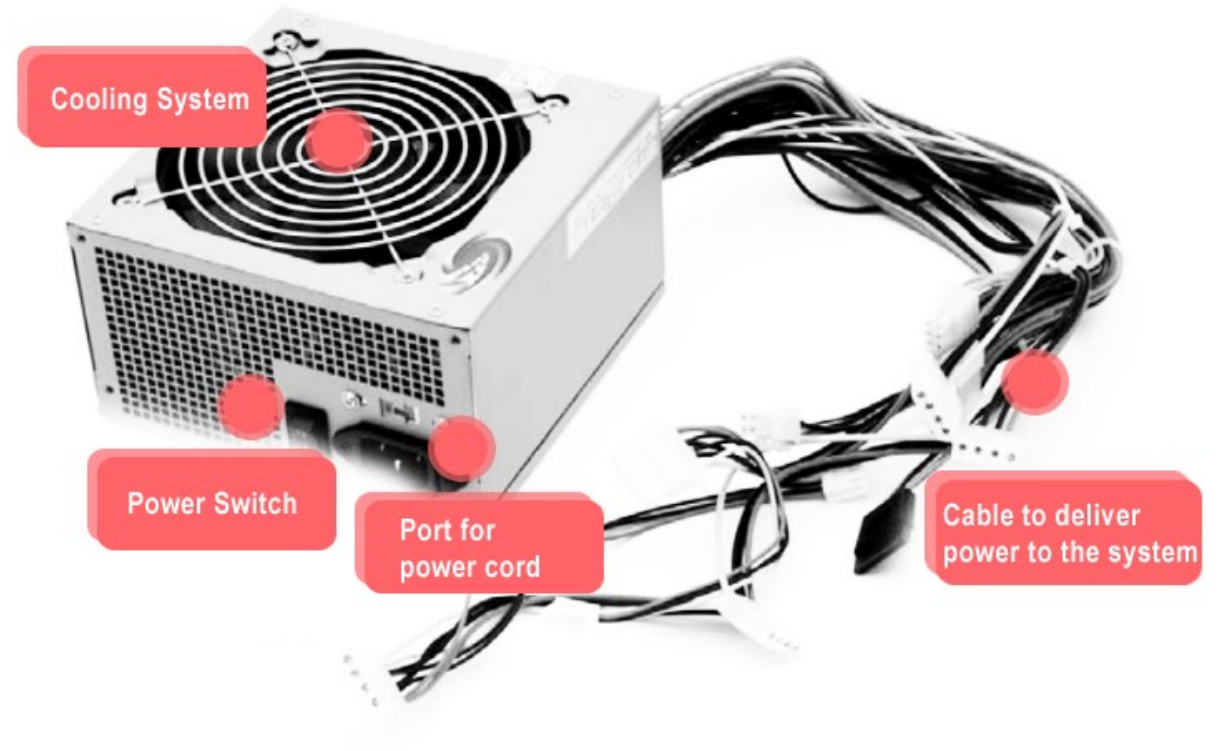
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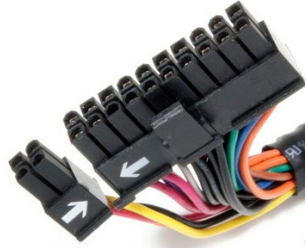
A power connector for floppy disk

molex

A power connector for IDE devices such as hard disk and optical disc drive

SATA

SATA power connector is a connector for SATA devices (e.g. hard disk, optical disc drive)

CSS

24 pin ATX

main power connector of the motherboard

4 pin ATX

is a standard motherboard power connector used to provide +12 VDC to the processor voltage regulator

PCIE Power connector

It is a power connector for video card

POWER SUPPLY

CSS

GRAPHICS CARD

Graphics Card (also called a video adapter, display card, graphics card, graphics board, display adapter or graphics adapter) is an expansion card which generates a feed of output images to a display.

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PCI

Short for Peripheral Component Interconnect, PCI was introduced by Intel in 1992.

The PCI bus came in both 32-bit (133MBps) and 64-bit versions and was used to attach hardware to a computer including video card.

Although commonly used in computers from the late 1990s to the early 2000s, PCI has since been replaced with PCI Express.

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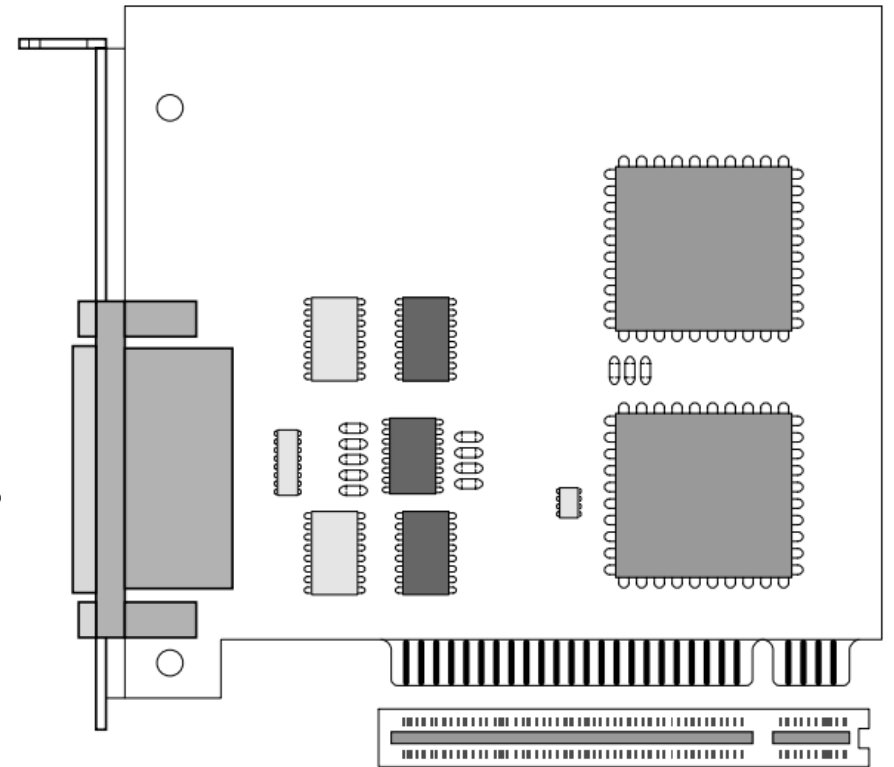
AGP

Short for accelerated graphics port, AGP is an advanced port designed for video cards and 3D accelerators.

Developed by Intel and introduced in August 1997.

AGP channel is 32-bits wide and runs at 66 MHz, which is a total bandwidth of 266 MBps and much greater than the PCI bandwidth of up to 133 MBps
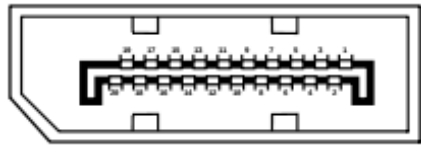
GRAPHIC CARD

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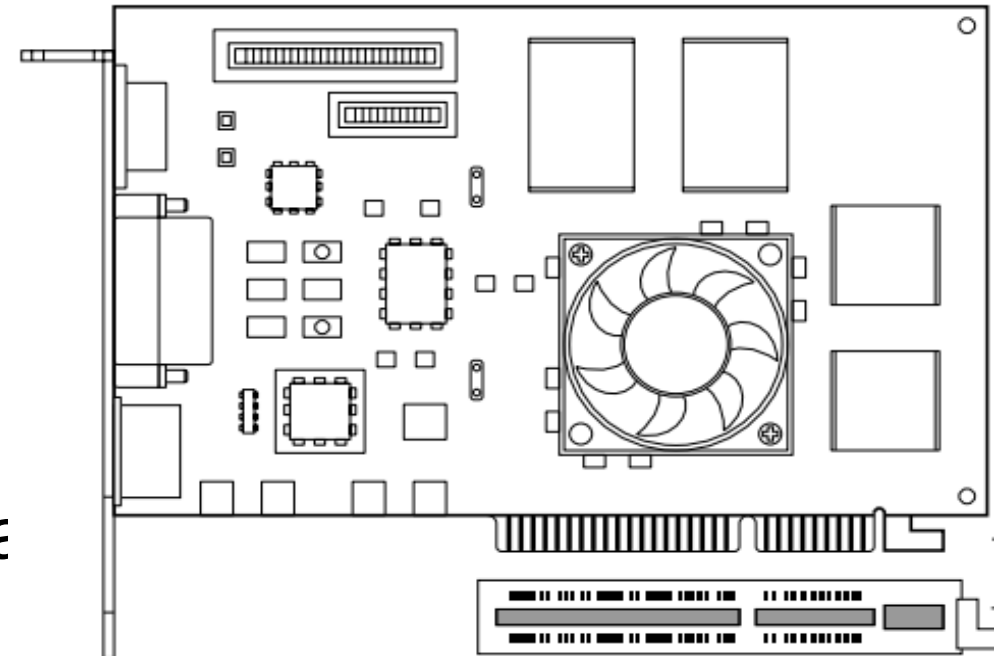
PCI-E

originally known as 3rd Generation I/O (3GIO),
PCI Express, or PCIe.

Approved in July 2002 as a serial
computer expansion bus standard.

It was designed as a high-speed
replacement for the aging PCI and
AGP standards and is available in
different formats.

Tab

Tab locking
mechanism

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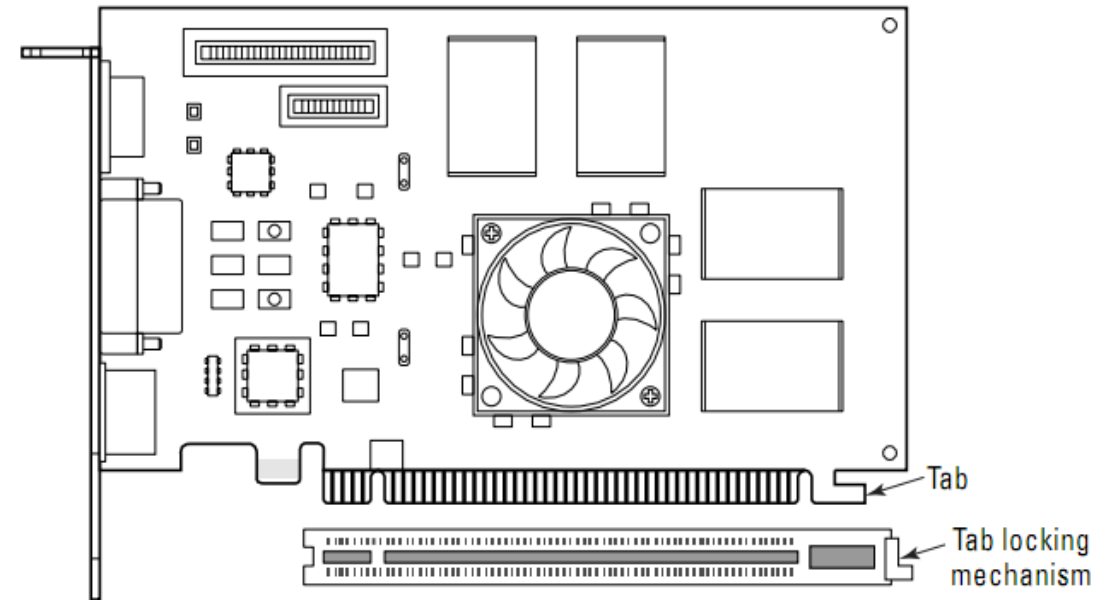
What's on the card?

DisplayPort is a digital display interface developed by the Video Electronics Standards Association (VESA). It can also be used to transmit audio, USB, and other forms of data.

High Definition Multimedia Interface simultaneously transmitting visual and audio data via the same cable.
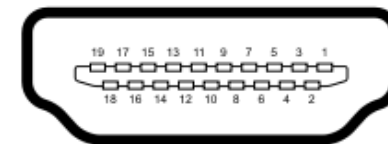
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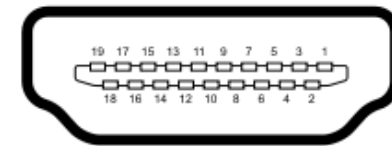
What's on the card?

(DVI) Digital Visual Interface Digital-based standard designed for displays such as flat-panel displays (LCDs, plasma screens, wide high-definition television displays) and video projectors
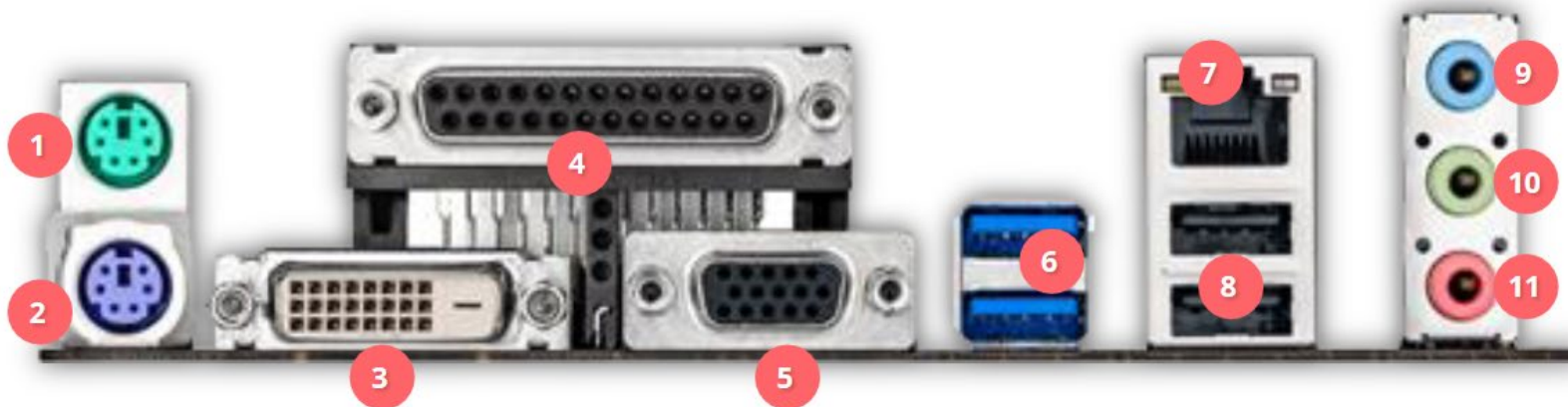
Analog D-Sub is standard interface for analog monitor. It was designed for CRT displays.

CSS

A port is connector on a motherboard or on a separate adapter that allows a device to connect to a computer.
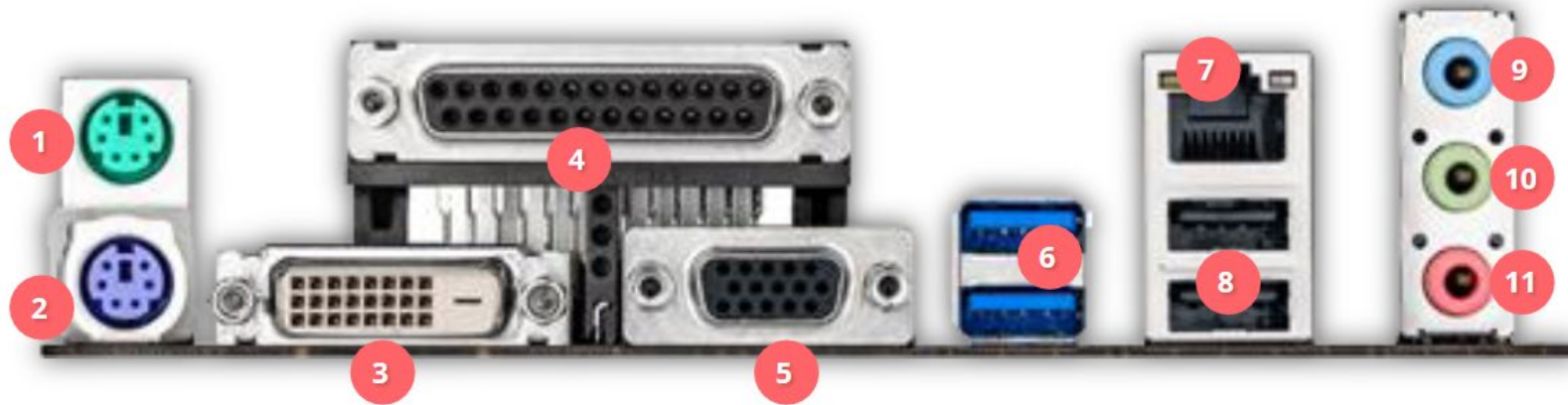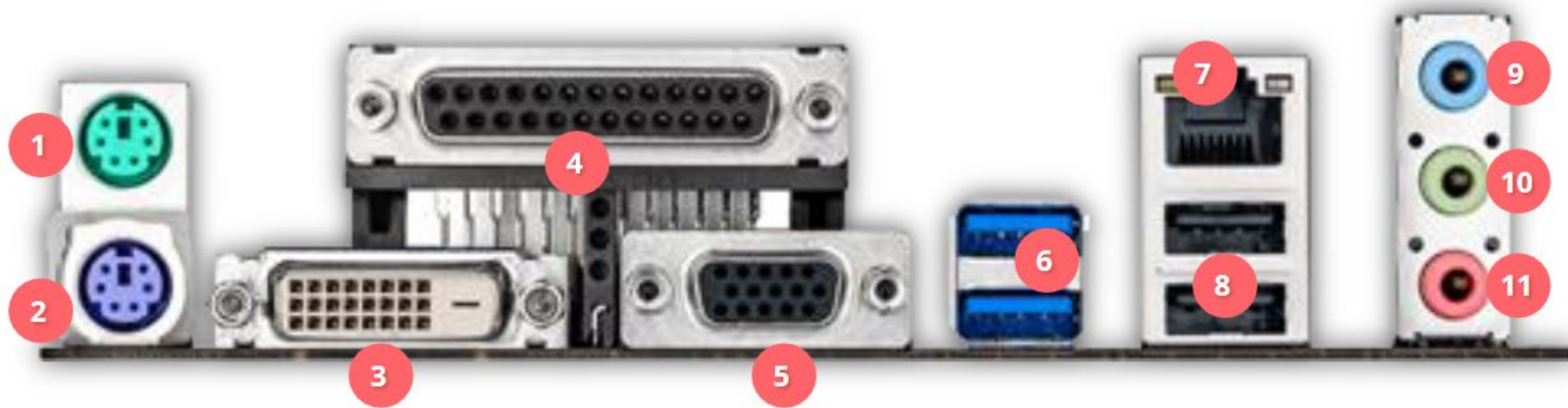
1 and 2

The PS/2 (Personal System/2) port, also referred to as the mouse port or keyboard port, was developed by IBM. It is used to connect a computer mouse or keyboard to an IBM compatible computer. The PS/2 port is a mini DIN plug that contains six pins and is still sometimes found on all IBM compatible computers.

3

DVI PORT (Digital Visual Interface)

Short for Digital Visual Interface, DVI is a video display interface. It was developed for transmitting digital video content to display devices at resolutions as high as 2560 x 1600. DVI can even be used with some TVs, although HDMI is more common as only some DVI cables can transmit audio signals.
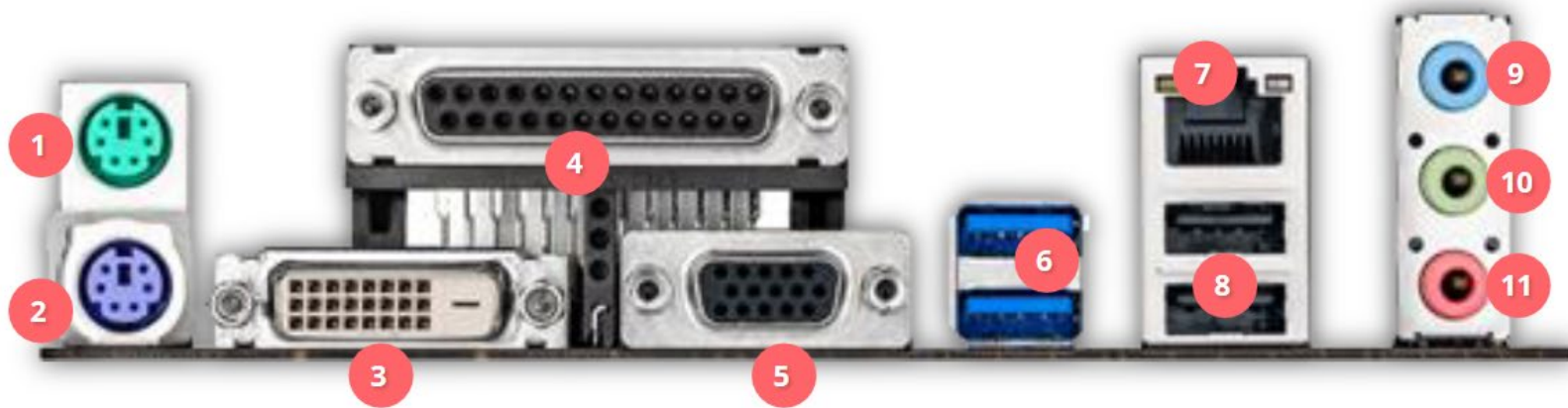
IO PORT

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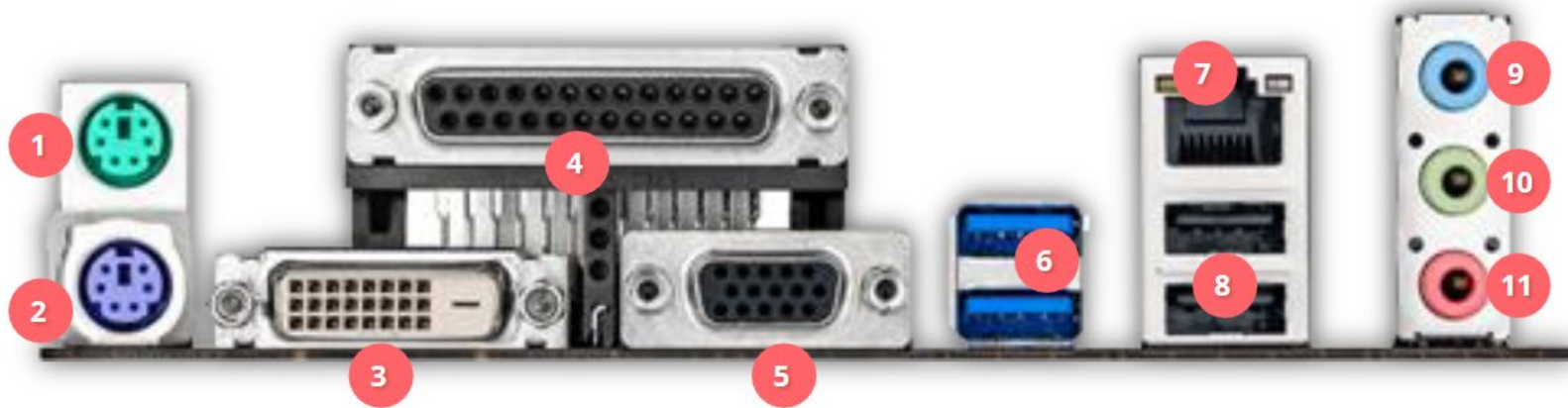
3

Short for Digital Visual Interface, DVI is a video display interface. It was developed for transmitting digital video content to display devices at resolutions as high as 2560 x 1600. DVI can even be used with some TVs, although HDMI is more common as only some DVI cables can transmit audio signals.

DVI or VGA?

If you have a monitor and GPU that support both DVI and VGA, we suggest going with a DVI cable as the picture quality will always be better with digital (and most analog) sources.

IO PORT

CSS

4

Parallel Port

referred to as the Centronics interface or Centronics connector after the company that originally designed it, the port was later developed by Epson. The parallel port is found on the back of IBM compatible computers and is a 25-pin (type DB-25) computer interface commonly used to connect printers to the computer.

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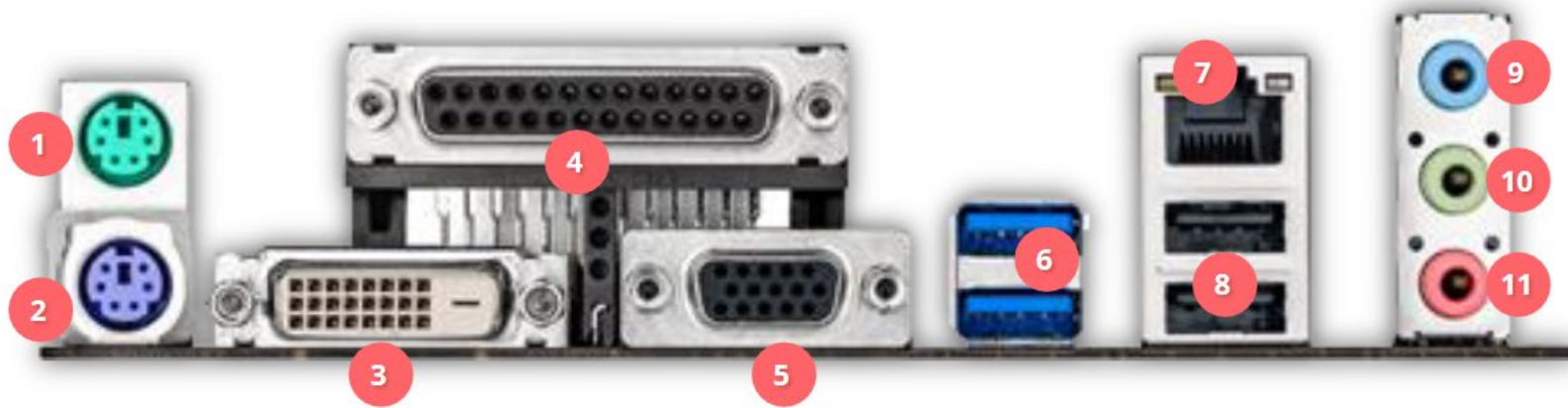
5

Video graphic array port (VGA port)

Short for Video Graphics Adapter or Video Graphics Array, VGA is a popular display standard developed by IBM and introduced in 1987. VGA provides 640 x 480 resolution color display screens with a refresh rate of 60 Hz and 16 colors displayed at a time. If the resolution is lowered to 320 x 200, 256 colors are shown.

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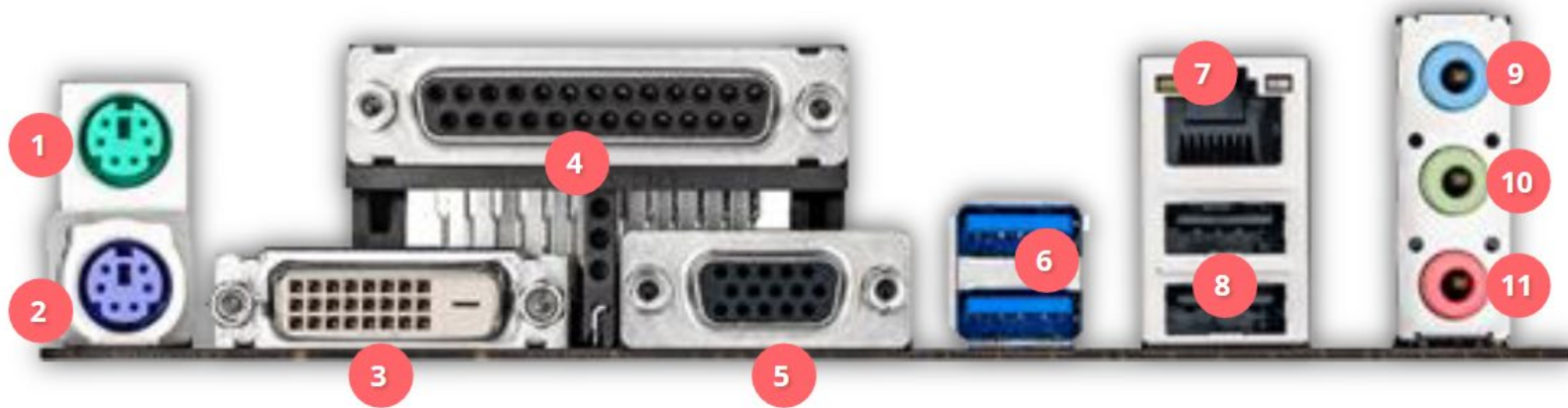
6

USB port

USB 3.0 is a Universal Serial Bus (USB) standard, released in November 2008. Most new computers and devices being manufactured today support USB 3.0. It is often referred to as SuperSpeed USB.

Maximum rate of 5 Gbps, or 5,120 Mbps.

USB 3.2 is an updated version of USB 3.1 (SuperSpeed+) and is the latest USB standard. It increases this theoretical maximum speed to 20 Gbps (20,480 Mbps), while USB 3.1 comes in at a maximum speed of 10 Gbps (10,240 Mbps).
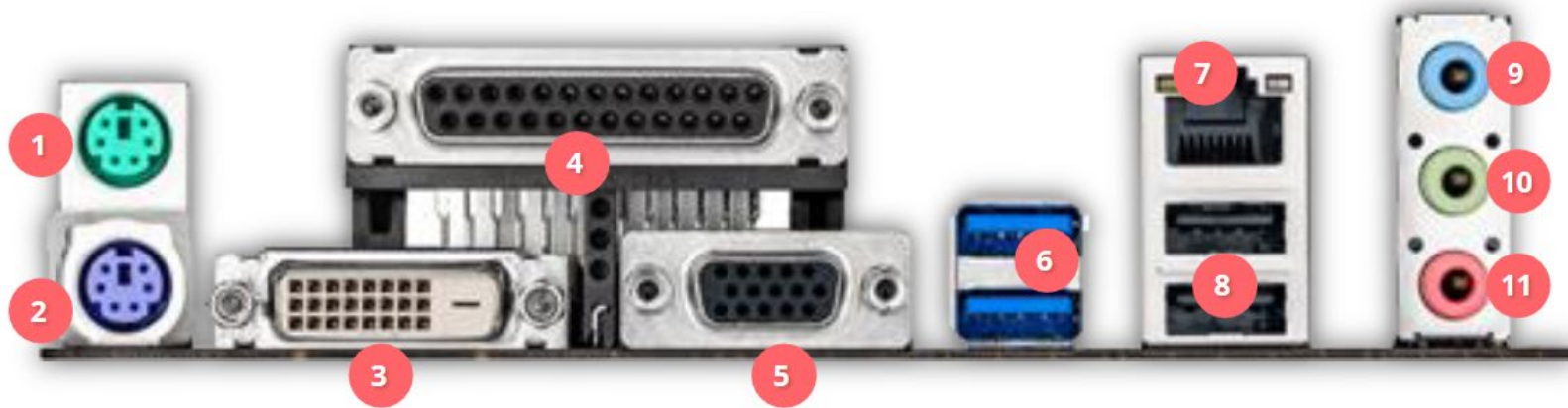
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LAN port

referred to as an Ethernet port, network connection, and network port, the LAN port allows a computer to connect to a network using a wired connection.
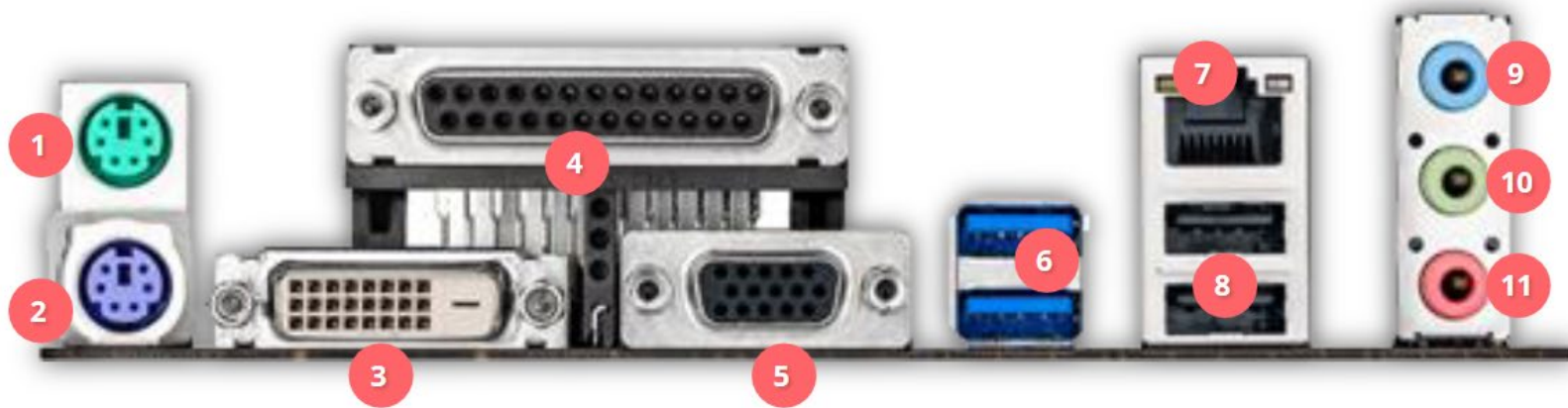
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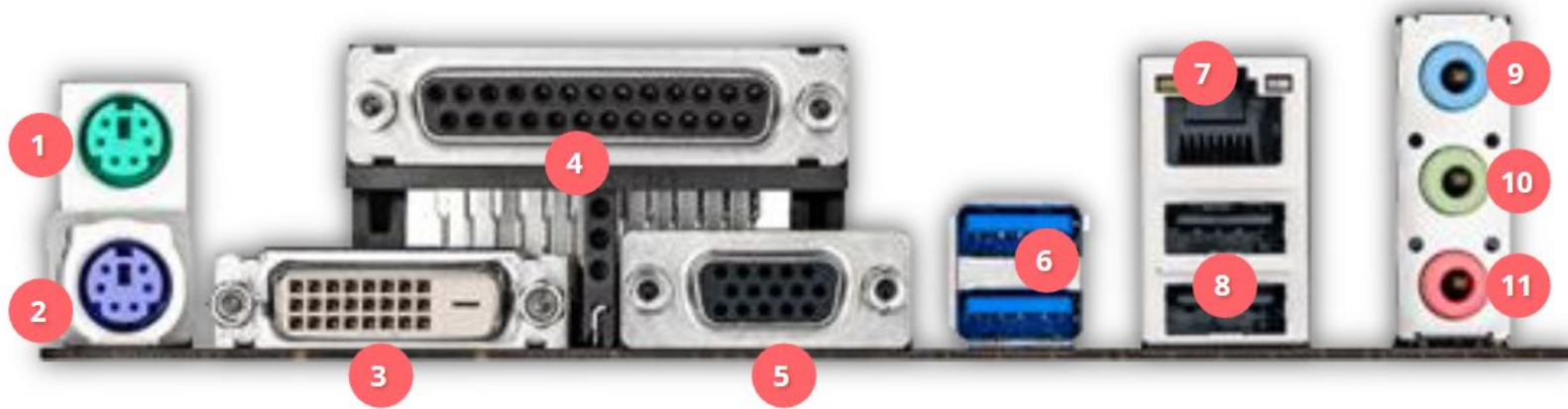
8

USB port (possibly a USB 1.1 or USB 2.0 port)

USB 2.0 was released in April 2000 and was stated to have a data transfer rate of up to 480 Mbps.

In August 1998, USB 1.1 was released and was much better received in the market. Many more USB devices were sold with the release of USB 1.1. Data transfer rate up to 12 Mbps
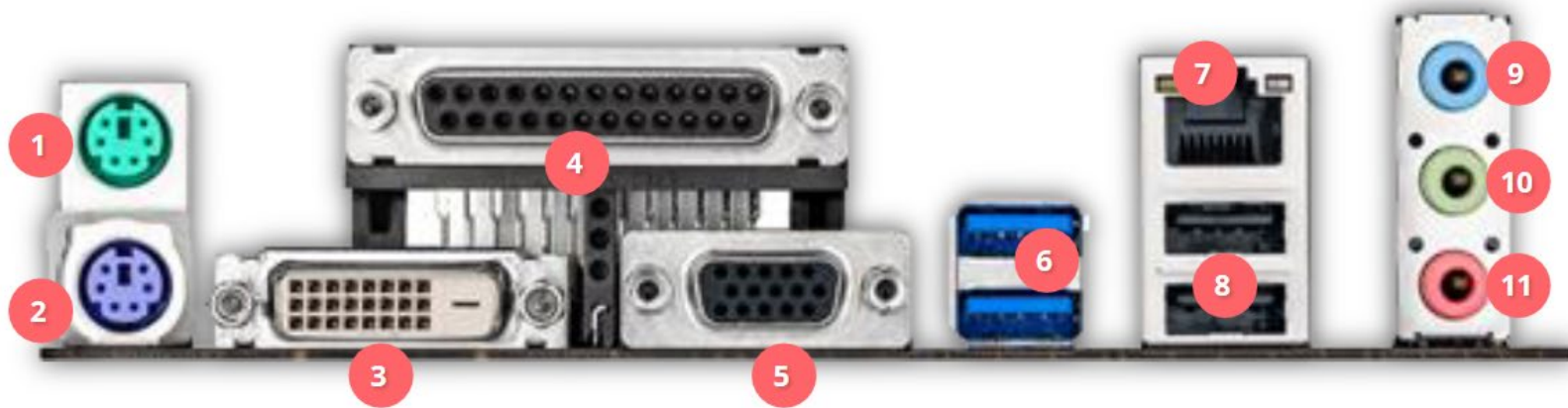
IO PORT

CSS

9

Line in

referred to as audio in and sound in, the line in or line-in is a jack found on computer sound cards that enable a user to connect an external audio device.

These devices include CD players, audio mixers, musical instruments, and microphones. They are used to record, play, and modify the incoming audio.
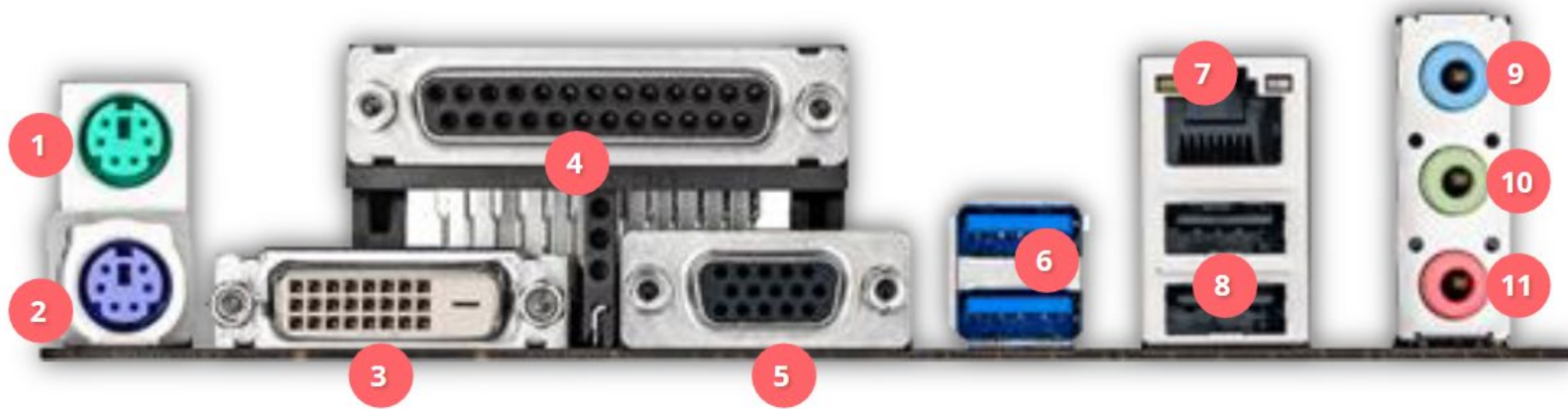
IO PORT

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10

Line out

referred to as audio out and sound out, the line out jack is found on computer sound cards.

It allows external speakers, headphones, or other output devices to be connected to the computer, transfering computer generated audio to the devices so that it can be heard.

IO PORT

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11

MIC

Port use to insert microphone*

*A microphone is a device that captures audio by converting sound waves into an electrical signal. This signal can be amplified as an analog signal or may be converted to a digital signal, which can be processed by a computer or other digital audio device

thank you!

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